

# SEQUENCE LISTING

<110> Oppermann, Hermann  
 Tai, Mei-Sheng  
 McCartney, John

<120> Modified TGF-beta Superfamily Proteins

<130> STK-075

<140>

<141>

<160> 88

<170> PatentIn Ver. 2.0

<210> 1

<211> 35

<212> PRT

<213> Drosophila melanogaster

<220>

<223> 60-A

<400> 1

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Pro | Thr | Arg | Leu | Gly | Ala | Leu | Pro | Val | Leu | Tyr | His | Leu | Asn | Asp |
| 1   |     |     |     | 5   |     |     |     | 10  |     |     |     |     |     | 15  |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Asn | Val | Asn | Leu | Lys | Lys | Tyr | Arg | Asn | Met | Ile | Val | Lys | Ser | Cys |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |

|     |     |     |
|-----|-----|-----|
| Gly | Cys | His |
|     |     | 35  |

<210> 2

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<213> Homo sapiens

<220>

<223> BMP-2

<400> 2

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Pro | Thr | Glu | Leu | Ser | Ala | Ile | Ser | Met | Leu | Tyr | Leu | Asp | Glu | Asn |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Lys | Val | Val | Leu | Lys | Asn | Tyr | Gln | Asp | Met | Val | Val | Glu | Gly | Cys |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |

|     |     |     |
|-----|-----|-----|
| Gly | Cys | Arg |
|     |     | 35  |

<210> 3

<211> 35

<212> PRT  
<213> Homo sapiens

<220>  
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Val Pro Glu Lys Met Ser Ser Leu Ser Ile Leu Phe Phe Asp Glu Asn  
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Lys Asn Val Val Leu Lys Val Tyr Pro Asn Met Thr Val Glu Ser Cys  
20 25 30  
Ala Cys Arg  
35

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<213> Homo sapiens

<220>  
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20 25 30  
Gly Cys Arg  
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<220>  
<223> BMP-5

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Ser Asn Val Ile Leu Lys Lys Tyr Arg Asn Met Val Val Arg Ser Cys  
20 25 30  
Gly Cys His  
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<212> PRT  
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Ser Asn Val Ile Leu Lys Lys Tyr Arg Asn Met Val Val Arg Ala Cys  
20 25 30  
Gly Cys His  
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<210> 7  
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<212> PRT  
<213> Homo sapiens

<220>  
<223> BMP-9

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Val Pro Thr Lys Leu Ser Pro Ile Ser Val Leu Tyr Lys Asp Asp Met  
1 5 10 15  
Gly Val Pro Thr Leu Lys Tyr His Tyr Glu Gly Met Ser Val Ala Glu  
20 25 30  
Cys Gly Cys Arg  
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<210> 8  
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<212> PRT  
<213> Homo sapiens

<220>  
<223> BMP-10

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Val Pro Thr Lys Leu Glu Pro Ile Ser Ile Leu Tyr Leu Asp Lys Gly  
1 5 10 15  
Val Val Thr Tyr Lys Phe Lys Tyr Glu Gly Met Ala Val Ser Glu Cys  
20 25 30  
Gly Cys Arg  
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<212> PRT  
<213> Homo sapiens

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<400> 9  
Thr Pro Thr Lys Met Ser Pro Ile Asn Met Leu Tyr Phe Asn Asp Lys  
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Gln Gln Ile Ile Tyr Gly Lys Ile Pro Gly Met Val Val Asp Arg Cys  
20 25 30  
Gly Cys Ser  
35

<210> 10  
<211> 35  
<212> PRT  
<213> Bos taurus

<220>  
<223> CDMP-2

<400> 10  
Val Pro Thr Lys Leu Thr Pro Ile Ser Ile Leu Tyr Ile Asp Ala Gly  
1 5 10 15  
Asn Asn Val Val Tyr Asn Glu Tyr Glu Glu Met Val Val Glu Ser Cys  
20 25 30  
Gly Cys Arg  
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<210> 11  
<211> 36  
<212> PRT  
<213> Gallus gallus

<220>  
<223> Dorsalin

<400> 11  
Val Pro Thr Lys Leu Asp Ala Ile Ser Ile Leu Tyr Lys Asp Asp Ala  
1 5 10 15  
Gly Val Pro Thr Leu Ile Tyr Asn Tyr Glu Gly Met Lys Val Ala Glu  
20 25 30  
Cys Gly Cys Arg  
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<210> 12  
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<212> PRT  
<213> *Drosophila melanogaster*

<220>  
<223> DPP

<400> 12  
Val Pro Thr Gln Leu Asp Ser Val Ala Met Leu Tyr Leu Asn Asp Gln  
1 5 10 15  
Ser Thr Val Val Leu Lys Asn Tyr Gln Glu Met Thr Val Val Gly Cys  
20 25 30  
Gly Cys Arg  
35

<210> 13  
<211> 35  
<212> PRT  
<213> *Mus musculus*

<220>  
<223> GDF-1

<400> 13  
Val Pro Glu Arg Leu Ser Pro Ile Ser Val Leu Phe Phe Asp Asn Glu  
1 5 10 15  
Asp Asn Val Val Leu Arg His Tyr Glu Asp Met Val Val Asp Glu Cys  
20 25 30  
Gly Cys Arg  
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<210> 14  
<211> 35  
<212> PRT  
<213> *Mus musculus*

<220>  
<223> GDF-3

<400> 14  
Val Pro Thr Lys Leu Ser Pro Ile Ser Met Leu Tyr Gln Asp Ser Asp  
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Lys Asn Val Ile Leu Arg His Tyr Glu Asp Met Val Val Asp Glu Cys  
20 25 30  
Gly Cys Gly  
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<210> 15  
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<212> PRT  
<213> Homo sapiens

<220>  
<223> GDF-5

<400> 15  
Val Pro Thr Arg Leu Ser Pro Ile Ser Ile Leu Phe Ile Asp Ser Ala  
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Asn Asn Val Val Tyr Lys Gln Tyr Glu Asp Met Val Val Glu Ser Cys  
20 25 30  
Gly Cys Arg  
35

<210> 16  
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<212> PRT  
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<220>  
<223> GDF-6

<400> 16  
Val Pro Thr Lys Leu Thr Pro Ile Ser Ile Leu Tyr Ile Asp Ala Gly  
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20 25 30  
Gly Cys Arg  
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<212> PRT  
<213> Mus musculus

<220>  
<223> GDF-7

<400> 17  
Val Pro Ala Arg Leu Ser Pro Ile Ser Ile Leu Tyr Ile Asp Ala Ala  
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Asn Asn Val Val Tyr Lys Gln Tyr Glu Asp Met Val Val Glu Ala Cys  
20 25 30  
Gly Cys Arg  
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<212> PRT  
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<400> 18  
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Gly Ser Ile Ala Tyr Lys Glu Tyr Glu Asp Met Ile Ala Thr Arg Cys  
20 25 30  
Thr Cys Arg  
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<212> PRT  
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<220>  
<223> GDNF

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Arg Pro Ile Ala Phe Asp Asp Asp Leu Ser Phe Leu Asp Asp Asn Leu  
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Val Tyr His Ile Leu Arg Lys His Ser Ala Lys Arg Cys Gly Cys Ile  
20 25 30

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<212> PRT  
<213> Homo sapiens

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<223> Inhibin Alpha

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Ala Ala Leu Pro Gly Thr Met Arg Pro Leu His Val Arg Thr Thr Ser  
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Asp Gly Gly Tyr Ser Phe Lys Tyr Glu Thr Val Pro Asn Leu Leu Thr  
20 25 30  
Gln His Cys Ala Cys Ile  
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<212> PRT  
<213> Homo sapiens

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<223> Inhibin BetaA

<400> 21  
Val Pro Thr Lys Leu Arg Pro Met Ser Met Leu Tyr Tyr Asp Asp Gly  
1 5 10 15  
Gln Asn Ile Ile Lys Lys Asp Ile Gln Asn Met Ile Val Glu Glu Cys  
20 25 30  
Gly Cys Ser  
35

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<212> PRT  
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<220>  
<223> Inhibin BetaB

<400> 22  
Ile Pro Thr Lys Leu Ser Thr Met Ser Met Leu Tyr Phe Asp Asp Glu  
1 5 10 15  
Tyr Asn Ile Val Lys Arg Asp Val Pro Asn Met Ile Val Glu Glu Cys  
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Gly Cys Ala  
35

<210> 23  
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<212> PRT  
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<223> Inhibin BetaC

<400> 23  
Val Pro Thr Ala Arg Arg Pro Leu Ser Leu Leu Tyr Tyr Asp Arg Asp  
1 5 10 15  
Ser Asn Ile Val Lys Thr Asp Ile Pro Asp Met Val Val Glu Ala Cys  
20 25 30  
Gly Cys Ser  
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<210> 24  
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<212> PRT  
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<400> 24  
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Arg Ile Ser Ala His His Val Pro Asn Met Val Ala Thr Glu Cys Gly  
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Cys Arg

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Ala Pro Val Lys Thr Lys Pro Leu Ser Met Leu Tyr Val Asp Asn Gly  
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Arg Val Leu Leu Glu His His Lys Asp Met Ile Val Glu Glu Cys Gly  
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Cys Leu

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<220>  
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Ala Pro Thr Lys Leu Ser Ala Thr Ser Val Leu Tyr Tyr Asp Ser Ser  
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Asn Asn Val Ile Leu Arg Lys His Arg Asn Met Val Val Lys Ala Cys  
20 25 30

Gly Cys His  
35

<210> 27  
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<223> OP-3

<400> 27  
Val Pro Thr Glu Leu Ser Ala Ile Ser Leu Leu Tyr Tyr Asp Arg Asn  
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20 25 30  
Gly Cys His  
35

<210> 28  
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<212> PRT  
<213> Drosophila melanogaster

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<223> Screw

<400> 28  
Val Pro Thr Val Leu Gly Ala Ile Thr Ile Leu Arg Tyr Leu Asn Glu  
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Asp Ile Ile Asp Leu Thr Lys Tyr Gln Lys Ala Val Ala Lys Glu Cys  
20 25 30  
Gly Cys His  
35

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<220>  
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Lys Pro Lys Val Glu Gln Leu Ser Asn Met Ile Val Arg Ser Cys Lys  
20 25 30  
Cys Ser

<210> 30  
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<212> PRT  
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<220>  
<223> TGF-Beta2

<400> 30  
Val Ser Gln Asp Leu Glu Pro Leu Thr Ile Leu Tyr Tyr Ile Gly Lys  
1 5 10 15  
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20 25 30

Cys Ser

<210> 31  
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<212> PRT  
<213> Homo sapiens

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<223> TGF-Beta3

<400> 31  
Val Pro Gln Asp Leu Glu Pro Leu Thr Ile Leu Tyr Tyr Val Gly Arg  
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Thr Pro Lys Val Glu Gln Leu Ser Asn Met Val Val Lys Ser Cys Lys  
20 25 30

Cys Ser

<210> 32  
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<212> PRT  
<213> Gallus gallus

<220>  
<223> TGF-Beta4

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Val Pro Gln Thr Leu Asp Pro Leu Pro Ile Ile Tyr Tyr Val Gly Arg  
1 5 10 15  
Asn Val Arg Val Glu Gln Leu Ser Asn Met Val Val Arg Ala Cys Lys  
20 25 30

Cys Ser

<210> 33  
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<212> PRT  
<213> *Xenopus laevis*

<220>  
<223> TGF-Beta5

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1 5 10 15  
Thr Ala Lys Val Glu Gln Leu Ser Asn Met Val Val Arg Ser Cys Asn  
20 25 30  
Cys Ser

<210> 34  
<211> 35  
<212> PRT  
<213> *Strongylocentrotus purpuratus*

<220>  
<223> UNIVIN

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Ala Pro Thr Lys Leu Ser Gly Ile Ser Met Leu Tyr Phe Asp Asn Asn  
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Glu Asn Val Val Leu Arg Gln Tyr Glu Asp Met Val Val Glu Ala Cys  
20 25 30  
Gly Cys Arg  
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<210> 35  
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<212> PRT  
<213> *Xenopus laevis*

<220>  
<223> VG-1

<400> 35  
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20 25 30  
Gly Cys Arg  
35

<210> 36  
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<212> DNA  
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<223> Description of Artificial Sequence:synthetic  
primer

<220>  
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Met Ser Thr Gly Ser Lys Gln  
1 5

21

<210> 37  
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Met His Val  
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cgc tca ctg cga gct gcg gcg ccg cac agc ttc gtg gcg ctc tgg gca 105  
Arg Ser Leu Arg Ala Ala Pro His Ser Phe Val Ala Leu Trp Ala  
5 10 15

ccc ctg ttc ctg ctg cgc tcc gcc ctg gcc gac ttc agc ctg gac aac 153  
Pro Leu Phe Leu Leu Arg Ser Ala Leu Ala Asp Phe Ser Leu Asp Asn  
20 25 30 35

gag gtg cac tcg agc ttc atc cac cgg cgc ctc cgc agc cag gag cgg 201  
Glu Val His Ser Ser Phe Ile His Arg Arg Leu Arg Ser Gln Glu Arg  
40 45 50

cgg gag atg cag cgc gag atc ctc tcc att ttg ggc ttg ccc cac cgc 249  
Arg Glu Met Gln Arg Glu Ile Leu Ser Ile Leu Gly Leu Pro His Arg  
55 60 65

|   |     |
|---|-----|
| ccg cgc ccg cac ctc cag ggc aag cac aac tcg gca ccc atg ttc atg | 297 |
| Pro Arg Pro His Leu Gln Gly Lys His Asn Ser Ala Pro Met Phe Met |     |
| 70 75 80  |     |
| ctg gac ctg tac aac gcc atg gcg gtg gag gag ggc ggc ggg ccc ggc | 345 |
| Leu Asp Leu Tyr Asn Ala Met Ala Val Glu Glu Gly Gly Gly Pro Gly |     |
| 85 90 95  |     |
| ggc cag ggc ttc tcc tac ccc tac aag gcc gtc ttc agt acc cag ggc | 393 |
| Gly Gln Gly Phe Ser Tyr Pro Tyr Lys Ala Val Phe Ser Thr Gln Gly |     |
| 100 105 110 115   |     |
| ccc cct ctg gcc agc ctg caa gat agc cat ttc ctc acc gac gcc gac | 441 |
| Pro Pro Leu Ala Ser Leu Gln Asp Ser His Phe Leu Thr Asp Ala Asp |     |
| 120 125 130   |     |
| atg gtc atg agc ttc gtc aac ctc gtg gaa cat gac aag gaa ttc ttc | 489 |
| Met Val Met Ser Phe Val Asn Leu Val Glu His Asp Lys Glu Phe Phe |     |
| 135 140 145   |     |
| cac cca cgc tac cac cat cga gag ttc cgg ttt gat ctt tcc aag atc | 537 |
| His Pro Arg Tyr His His Arg Glu Phe Arg Phe Asp Leu Ser Lys Ile |     |
| 150 155 160   |     |
| cca gaa ggg gaa gct gtc acg gca gcc gaa ttc cgg atc tac aag gac | 585 |
| Pro Glu Gly Glu Ala Val Thr Ala Ala Glu Phe Arg Ile Tyr Lys Asp |     |
| 165 170 175   |     |
| tac atc cgg gaa cgc ttc gac aat gag acg ttc cgg atc agc gtt tat | 633 |
| Tyr Ile Arg Glu Arg Phe Asp Asn Glu Thr Phe Arg Ile Ser Val Tyr |     |
| 180 185 190 195   |     |
| cag gtg ctc cag gag cac ttg ggc agg gaa tcg gat ctc ttc ctg ctc | 681 |
| Gln Val Leu Gln Glu His Leu Gly Arg Glu Ser Asp Leu Phe Leu Leu |     |
| 200 205 210   |     |
| gac agc cgt acc ctc tgg gcc tcg gag gag ggc tgg ctg gtg ttt gac | 729 |
| Asp Ser Arg Thr Leu Trp Ala Ser Glu Glu Gly Trp Leu Val Phe Asp |     |
| 215 220 225   |     |
| atc aca gcc acc agc aac cac ttg gtg gtc aat ccg cgg cac aac ctg | 777 |
| Ile Thr Ala Thr Ser Asn His Trp Val Val Asn Pro Arg His Asn Leu |     |
| 230 235 240   |     |
| ggc ctg cag ctc tcg gtg gag acg ctg gat ggg cag agc atc aac ccc | 825 |
| Gly Leu Gln Leu Ser Val Glu Thr Leu Asp Gly Gln Ser Ile Asn Pro |     |
| 245 250 255   |     |
| aag ttg gcg ggc ctg att ggg cgg cac ggg ccc cag aac aag cag ccc | 873 |
| Lys Leu Ala Gly Leu Ile Gly Arg His Gly Pro Gln Asn Lys Gln Pro |     |
| 260 265 270 275   |     |
| ttc atg gtg gct ttc ttc aag gcc acg gag gtc cac ttc cgc agc atc | 921 |
| Phe Met Val Ala Phe Phe Lys Ala Thr Glu Val His Phe Arg Ser Ile |     |
| 280 285 290   |     |

cgg tcc acg ggg agc aaa cag cgc agc cag aac cgc tcc aag acg ccc 969  
 Arg Ser Thr Gly Ser Lys Gln Arg Ser Gln Asn Arg Ser Lys Thr Pro  
 295 300 305

aag aac cag gaa gcc ctg cgg atg gcc aac gtg gca gag aac agc agc 1017  
 Lys Asn Gln Glu Ala Leu Arg Met Ala Asn Val Ala Glu Asn Ser Ser  
 310 315 320

agc gac cag agg cag gcc tgt aag aag cac gag ctg tat gtc agc ttc 1065  
 Ser Asp Gln Arg Gln Ala Cys Lys Lys His Glu Leu Tyr Val Ser Phe  
 325 330 335

cga gac ctg ggc tgg cag gac tgg atc atc gcg cct gaa ggc tac gcc 1113  
 Arg Asp Leu Gly Trp Gln Asp Trp Ile Ile Ala Pro Glu Gly Tyr Ala  
 340 345 350 355

gcc tac tac tgt gag ggg gag tgt gcc ttc cct ctg aac tcc tac atg 1161  
 Ala Tyr Tyr Cys Glu Gly Glu Cys Ala Phe Pro Leu Asn Ser Tyr Met  
 360 365 370

aac gcc acc aac cac gcc atc gtg cag acg ctg gtc cac ttc atc aac 1209  
 Asn Ala Thr Asn His Ala Ile Val Gln Thr Leu Val His Phe Ile Asn  
 375 380 385

ccg gaa acg gtg ccc aag ccc tgc tgt gcg ccc acg cag ctc aat gcc 1257  
 Pro Glu Thr Val Pro Lys Pro Cys Cys Ala Pro Thr Gln Leu Asn Ala  
 390 395 400

atc tcc gtc ctc tac ttc gat gac agc tcc aac gtc atc ctg aag aaa 1305  
 Ile Ser Val Leu Tyr Phe Asp Asp Ser Ser Asn Val Ile Leu Lys Lys  
 405 410 415

tac aga aac atg gtg gtc cgg gcc tgt ggc tgc cac tagctcctcc 1351  
 Tyr Arg Asn Met Val Arg Ala Cys Gly Cys His  
 420 425 430

gagaattcag accctttggg gccaaagtttt tctggatcct ccattgctcg ccttggccag 1411  
 gaaccagcag accaactgcc ttttgtgaga ccttccctc cctatcccca actttaag 1471  
 tgtgagagta ttaggaaaca tgagcagcat atggcttttg atcagttttt cagtggcagc 1531  
 atccaatgaa caagatccta caagctgtgc aggcaaaacc tagcaggaaa aaaaaacaac 1591  
 gcataaagaa aaatggccgg gccaggtcat tggctgggaa gtctcagcca tgcacggact 1651  
 cgtttccaga ggtaattatg agcgcctacc agccaggcca cccagccgtg ggaggaaggg 1711  
 ggcgtggcaa ggggtgggca cattggtgtc tgtgcgaaag gaaaattgac ccggaagtgc 1771  
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<210> 39  
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 <212> PRT  
 <213> Homo sapiens

<400> 39

Met His Val Arg Ser Leu Arg Ala Ala Ala Pro His Ser Phe Val Ala  
1 5 10 15

Leu Trp Ala Pro Leu Phe Leu Leu Arg Ser Ala Leu Ala Asp Phe Ser  
20 25 30

Leu Asp Asn Glu Val His Ser Ser Phe Ile His Arg Arg Leu Arg Ser  
35 40 45

Gln Glu Arg Arg Glu Met Gln Arg Glu Ile Leu Ser Ile Leu Gly Leu  
50 55 60

Pro His Arg Pro Arg Pro His Leu Gln Gly Lys His Asn Ser Ala Pro  
65 70 75 80

Met Phe Met Leu Asp Leu Tyr Asn Ala Met Ala Val Glu Glu Gly Gly  
85 90 95

Gly Pro Gly Gly Gln Gly Phe Ser Tyr Pro Tyr Lys Ala Val Phe Ser  
100 105 110

Thr Gln Gly Pro Pro Leu Ala Ser Leu Gln Asp Ser His Phe Leu Thr  
115 120 125

Asp Ala Asp Met Val Met Ser Phe Val Asn Leu Val Glu His Asp Lys  
130 135 140

Glu Phe Phe His Pro Arg Tyr His His Arg Glu Phe Arg Phe Asp Leu  
145 150 155 160

Ser Lys Ile Pro Glu Gly Glu Ala Val Thr Ala Ala Glu Phe Arg Ile  
165 170 175

Tyr Lys Asp Tyr Ile Arg Glu Arg Phe Asp Asn Glu Thr Phe Arg Ile  
180 185 190

Ser Val Tyr Gln Val Leu Gln Glu His Leu Gly Arg Glu Ser Asp Leu  
195 200 205

Phe Leu Leu Asp Ser Arg Thr Leu Trp Ala Ser Glu Glu Gly Trp Leu  
210 215 220

Val Phe Asp Ile Thr Ala Thr Ser Asn His Trp Val Val Asn Pro Arg  
225 230 235 240

His Asn Leu Gly Leu Gln Leu Ser Val Glu Thr Leu Asp Gly Gln Ser  
245 250 255

Ile Asn Pro Lys Leu Ala Gly Leu Ile Gly Arg His Gly Pro Gln Asn  
260 265 270

Lys Gln Pro Phe Met Val Ala Phe Phe Lys Ala Thr Glu Val His Phe  
275 280 285

Arg Ser Ile Arg Ser Thr Gly Ser Lys Gln Arg Ser Gln Asn Arg Ser



|   |     |     |     |         |
|---|-----|-----|-----|---------|
| 290   |     | 295 |     | 300     |
| Lys Thr Pro Lys Asn Gln Glu Ala Leu Arg Met Ala Asn Val Ala Glu |     |     |     |         |
| 305   |     | 310 |     | 315 320 |
| Asn Ser Ser Ser Asp Gln Arg Gln Ala Cys Lys Lys His Glu Leu Tyr |     |     |     |         |
|   | 325 |     | 330 | 335     |
| Val Ser Phe Arg Asp Leu Gly Trp Gln Asp Trp Ile Ile Ala Pro Glu |     |     |     |         |
|   | 340 |     | 345 | 350     |
| Gly Tyr Ala Ala Tyr Tyr Cys Glu Gly Glu Cys Ala Phe Pro Leu Asn |     |     |     |         |
|   | 355 |     | 360 | 365     |
| Ser Tyr Met Asn Ala Thr Asn His Ala Ile Val Gln Thr Leu Val His |     |     |     |         |
|   | 370 |     | 375 | 380     |
| Phe Ile Asn Pro Glu Thr Val Pro Lys Pro Cys Cys Ala Pro Thr Gln |     |     |     |         |
|   | 385 |     | 390 | 395 400 |
| Leu Asn Ala Ile Ser Val Leu Tyr Phe Asp Asp Ser Ser Asn Val Ile |     |     |     |         |
|   | 405 |     | 410 | 415     |
| Leu Lys Lys Tyr Arg Asn Met Val Val Arg Ala Cys Gly Cys His     |     |     |     |         |
|   | 420 |     | 425 | 430     |

<210> 40  
 <211> 98  
 <212> PRT  
 <213> Homo sapiens

<220>  
 <223> TGF-Betal

<400> 40  
 Cys Cys Val Arg Gln Leu Tyr Ile Asp Phe Arg Lys Asp Leu Gly Trp  
 1 5 10 15  
 Lys Trp Ile His Glu Pro Lys Gly Tyr His Ala Asn Phe Cys Leu Gly  
 20 25 30  
 Pro Cys Pro Tyr Ile Trp Ser Leu Asp Thr Gln Tyr Ser Lys Val Leu  
 35 40 45  
 Ala Leu Tyr Asn Gln His Asn Pro Gly Ala Ser Ala Ala Pro Cys Cys  
 50 55 60  
 Val Pro Gln Ala Leu Glu Pro Leu Pro Ile Val Tyr Tyr Val Gly Arg  
 65 70 75 80  
 Lys Pro Lys Val Glu Gln Leu Ser Asn Met Ile Val Arg Ser Cys Lys  
 85 90 95  
 Cys Ser

<210> 41  
 <211> 98  
 <212> PRT  
 <213> Homo sapiens

<220>  
 <223> TGF-Beta2

<400> 41  
 Cys Cys Leu Arg Pro Leu Tyr Ile Asp Phe Lys Arg Asp Leu Gly Trp  
   1                  5                  10                  15  
 Lys Trp Ile His Glu Pro Lys Gly Tyr Asn Ala Asn Phe Cys Ala Gly  
           20                  25                  30  
 Ala Cys Pro Tyr Leu Trp Ser Ser Asp Thr Gln His Ser Arg Val Leu  
           35                  40                  45  
 Ser Leu Tyr Asn Thr Ile Asn Pro Glu Ala Ser Ala Ser Pro Cys Cys  
       50                  55                  60  
 Val Ser Gln Asp Leu Glu Pro Leu Thr Ile Leu Tyr Tyr Ile Gly Lys  
   65                  70                  75                  80  
 Thr Pro Lys Ile Glu Gln Leu Ser Asn Met Ile Val Lys Ser Cys Lys  
           85                  90                  95  
 Cys Ser

<210> 42  
 <211> 98  
 <212> PRT  
 <213> Homo sapiens

<220>  
 <223> TGF-Beta3

<400> 42  
 Cys Cys Val Arg Pro Leu Tyr Ile Asp Phe Arg Gln Asp Leu Gly Trp  
   1                  5                  10                  15  
 Lys Trp Val His Glu Pro Lys Gly Tyr Tyr Ala Asn Phe Cys Ser Gly  
           20                  25                  30  
 Pro Cys Pro Tyr Leu Arg Ser Ala Asp Thr Thr His Ser Thr Val Leu  
       35                  40                  45  
 Gly Leu Tyr Asn Thr Leu Asn Pro Glu Ala Ser Ala Ser Pro Cys Cys  
       50                  55                  60  
 Val Pro Gln Asp Leu Glu Pro Leu Thr Ile Leu Tyr Tyr Val Gly Arg  
   65                  70                  75                  80  
 Thr Pro Lys Val Glu Gln Leu Ser Asn Met Val Val Lys Ser Cys Lys

85

90

95

Cys Ser

&lt;210&gt; 43

&lt;211&gt; 98

&lt;212&gt; PRT

&lt;213&gt; Gallus gallus

&lt;220&gt;

&lt;223&gt; TGF-Beta4

&lt;400&gt; 43

Cys Cys Val Arg Pro Leu Tyr Ile Asp Phe Arg Lys Asp Leu Gln Trp  
 1 5 10 15

Lys Trp Ile His Glu Pro Lys Gly Tyr Met Ala Asn Phe Cys Met Gly  
 20 25 30

Pro Cys Pro Tyr Ile Trp Ser Ala Asp Thr Gln Tyr Thr Lys Val Leu  
 35 40 45

Ala Leu Tyr Asn Gln His Asn Pro Gly Ala Ser Ala Ala Pro Cys Cys  
 50 55 60

Val Pro Gln Thr Leu Asp Pro Leu Pro Ile Ile Tyr Tyr Val Gly Arg  
 65 70 75 80

Asn Val Arg Val Glu Gln Leu Ser Asn Met Val Val Arg Ala Cys Lys  
 85 90 95

Cys Ser

&lt;210&gt; 44

&lt;211&gt; 98

&lt;212&gt; PRT

&lt;213&gt; Xenopus laevis

&lt;220&gt;

&lt;223&gt; TGF-Beta5

&lt;400&gt; 44

Cys Cys Val Lys Pro Leu Tyr Ile Asn Phe Arg Lys Asp Leu Gly Trp  
 1 5 10 15

Lys Trp Ile His Glu Pro Lys Gly Tyr Glu Ala Asn Tyr Cys Leu Gly  
 20 25 30

Asn Cys Pro Tyr Ile Trp Ser Met Asp Thr Gln Tyr Ser Lys Val Leu  
 35 40 45

Ser Leu Tyr Asn Gln Asn Asn Pro Gly Ala Ser Ile Ser Pro Cys Cys  
 50 55 60

Val Pro Asp Val Leu Glu Pro Leu Pro Ile Ile Tyr Tyr Val Gly Arg  
65 70 75 80

Thr Ala Lys Val Glu Gln Leu Ser Asn Met Val Val Arg Ser Cys Asn  
85 90 95

Cys Ser

<210> 45  
<211> 102  
<212> PRT  
<213> *Drosophila melanogaster*

<220>  
<223> DPP

<400> 45  
Cys Arg Arg His Ser Leu Tyr Val Asp Phe Ser Asp Val Gly Trp Asp  
1 5 10 15  
Asp Trp Ile Val Ala Pro Leu Gly Tyr Asp Ala Tyr Tyr Cys His Gly  
20 25 30  
Lys Cys Pro Phe Pro Leu Ala Asp His Phe Asn Ser Thr Asn His Ala  
35 40 45  
Val Val Gln Thr Leu Val Asn Asn Met Asn Pro Gly Lys Val Pro Lys  
50 55 60  
Ala Cys Cys Val Pro Thr Gln Leu Asp Ser Val Ala Met Leu Tyr Leu  
65 70 75 80  
Asn Asp Gln Ser Thr Val Val Leu Lys Asn Tyr Gln Glu Met Thr Val  
85 90 95  
Val Gly Cys Gly Cys Arg  
100

<210> 46  
<211> 102  
<212> PRT  
<213> *Xenopus laevis*

<220>  
<223> VG1

<400> 46  
Cys Lys Lys Arg His Leu Tyr Val Glu Phe Lys Asp Val Gly Trp Gln  
1 5 10 15  
Asn Trp Val Ile Ala Pro Gln Gly Tyr Met Ala Asn Tyr Cys Tyr Gly  
20 25 30

Glu Cys Pro Tyr Pro Leu Thr Glu Ile Leu Asn Gly Ser Asn His Ala  
           35                          40                          45  
 Ile Leu Gln Thr Leu Val His Ser Ile Glu Pro Glu Asp Ile Pro Leu  
           50                          55                          60  
 Pro Cys Cys Val Pro Thr Lys Met Ser Pro Ile Ser Met Leu Phe Tyr  
           65                          70                          75                          80  
 Asp Asn Asn Asp Asn Val Val Leu Arg His Tyr Glu Asn Met Ala Val  
                           85                          90                          95  
 Asp Glu Cys Gly Cys Arg  
                           100

<210> 47  
 <211> 102  
 <212> PRT  
 <213> Mus musculus

<220>  
 <223> VGR1

<400> 47  
 Cys Lys Lys His Glu Leu Tyr Val Ser Phe Gln Asp Leu Gly Trp Gln  
   1                          5                          10                          15  
 Asp Trp Ile Ile Ala Pro Lys Gly Tyr Ala Ala Asn Tyr Cys Asp Gly  
                           20                          25                          30  
 Glu Cys Ser Phe Pro Leu Asn Ala His Met Asn Ala Thr Asn His Ala  
           35                          40                          45  
 Ile Val Gln Thr Leu Val His Leu Met Asn Pro Glu Tyr Val Pro Lys  
           50                          55                          60  
 Pro Cys Cys Ala Pro Thr Lys Leu Asn Ala Ile Ser Val Leu Tyr Phe  
           65                          70                          75                          80  
 Asp Asp Asn Ser Asn Val Ile Leu Lys Lys Tyr Arg Asn Met Val Val  
                           85                          90                          95  
 Arg Ala Cys Gly Cys His  
                           100

<210> 48  
 <211> 118  
 <212> PRT  
 <213> Drosophila melanogaster

<220>  
 <223> 60A

<400> 48  
 Cys Gln Met Gln Thr Leu Tyr Ile Asp Phe Lys Asp Leu Gly Trp His

|   |     |     |     |
|---|-----|-----|-----|
| 1   | 5   | 10  | 15  |
| Asp Trp Ile Ile Ala Pro Glu Gly Tyr Gly Ala Phe Tyr Cys Ser Gly | 20  | 25  | 30  |
| Glu Cys Asn Phe Pro Leu Asn Ala His Met Asn Ala Thr Asn His Ala | 35  | 40  | 45  |
| Ile Val Gln Thr Leu Val His Leu Leu Glu Pro Lys Lys Val Pro Lys | 50  | 55  | 60  |
| Pro Cys Cys Ala Pro Thr Arg Leu Gly Ala Leu Pro Val Leu Tyr His | 65  | 70  | 75  |
| Pro Cys Cys Ala Pro Thr Arg Leu Gly Ala Leu Pro Val Leu Tyr His | 85  | 90  | 95  |
| Leu Asn Asp Glu Asn Val Asn Leu Lys Lys Tyr Arg Asn Met Ile Val | 100 | 105 | 110 |
| Lys Ser Cys Gly Cys His   | 115 |     |     |

<210> 49  
 <211> 101  
 <212> PRT  
 <213> Homo sapiens

<220>  
 <223> BMP-2A

|   |
|---|
| <400> 49  |
| Cys Lys Arg His Pro Leu Tyr Val Asp Phe Ser Asp Val Gly Trp Asn |
| 1 5 10 15   |
| Asp Trp Ile Val Ala Pro Pro Gly Tyr His Ala Phe Tyr Cys His Gly |
| 20 25 30  |
| Glu Cys Pro Phe Pro Leu Ala Asp His Leu Asn Ser Thr Asn His Ala |
| 35 40 45  |
| Ile Val Gln Thr Leu Val Asn Ser Val Asn Ser Lys Ile Pro Lys Ala |
| 50 55 60  |
| Cys Cys Val Pro Thr Glu Leu Ser Ala Ile Ser Met Leu Tyr Leu Asp |
| 65 70 75 80   |
| Glu Asn Glu Lys Val Val Leu Lys Asn Tyr Gln Asp Met Val Val Glu |
| 85 90 95  |
| Gly Cys Gly Cys Arg   |
| 100   |

<210> 50  
 <211> 103

<212> PRT  
<213> Homo sapiens

<220>  
<223> BMP3

<400> 50  
Cys Ala Arg Arg Tyr Leu Lys Val Asp Phe Ala Asp Ile Gly Trp Ser  
1 5 10 15  
Glu Trp Ile Ile Ser Pro Lys Ser Phe Asp Ala Tyr Tyr Cys Ser Gly  
20 25 30  
Ala Cys Gln Phe Pro Met Pro Lys Ser Leu Lys Pro Ser Asn His Ala  
35 40 45  
Thr Ile Gln Ser Ile Val Arg Ala Val Gly Val Val Pro Gly Ile Pro  
50 55 60  
Glu Pro Cys Cys Val Pro Glu Lys Met Ser Ser Leu Ser Ile Leu Phe  
65 70 75 80  
Phe Asp Glu Asn Lys Asn Val Val Leu Lys Val Tyr Pro Asn Met Thr  
85 90 95  
Val Glu Ser Cys Ala Cys Arg  
100

<210> 51  
<211> 101  
<212> PRT  
<213> Homo sapiens

<220>  
<223> BMP-4

<400> 51  
Cys Arg Arg His Ser Leu Tyr Val Asp Phe Ser Asp Val Gly Trp Asn  
1 5 10 15  
Asp Trp Ile Val Ala Pro Pro Gly Tyr Gln Ala Phe Tyr Cys His Gly  
20 25 30  
Asp Cys Pro Phe Pro Leu Ala Asp His Leu Asn Ser Thr Asn His Ala  
35 40 45  
Ile Val Gln Thr Leu Val Asn Ser Val Asn Ser Ser Ile Pro Lys Ala  
50 55 60  
Cys Cys Val Pro Thr Glu Leu Ser Ala Ile Ser Met Leu Tyr Leu Asp  
65 70 75 80  
Glu Tyr Asp Lys Val Val Leu Lys Asn Tyr Gln Glu Met Val Val Glu  
85 90 95  
Gly Cys Gly Cys Arg

100

<210> 52  
<211> 102  
<212> PRT  
<213> Homo sapiens

<220>  
<223> BMP-5

<400> 52  
Cys Lys Lys His Glu Leu Tyr Val Ser Phe Arg Asp Leu Gly Trp Gln  
1 5 10 15  
Asp Trp Ile Ile Ala Pro Glu Gly Tyr Ala Ala Phe Tyr Cys Asp Gly  
20 25 30  
Glu Cys Ser Phe Pro Leu Asn Ala His Met Asn Ala Thr Asn His Ala  
35 40 45  
Ile Val Gln Thr Leu Val His Leu Met Phe Pro Asp His Val Pro Lys  
50 55 60  
Pro Cys Cys Ala Pro Thr Lys Leu Asn Ala Ile Ser Val Leu Tyr Phe  
65 70 75 80  
Asp Asp Ser Ser Asn Val Ile Leu Lys Lys Tyr Arg Asn Met Val Val  
85 90 95  
Arg Ser Cys Gly Cys His  
100

<210> 53  
<211> 102  
<212> PRT  
<213> Homo sapiens

<220>  
<223> BMP-6

<400> 53  
Cys Arg Lys His Glu Leu Tyr Val Ser Phe Gln Asp Leu Gly Trp Gln  
1 5 10 15  
Asp Trp Ile Ile Ala Pro Lys Gly Tyr Ala Ala Asn Tyr Cys Asp Gly  
20 25 30  
Glu Cys Ser Phe Pro Leu Asn Ala His Met Asn Ala Thr Asn His Ala  
35 40 45  
Ile Val Gln Thr Leu Val His Leu Met Asn Pro Glu Tyr Val Pro Lys  
50 55 60  
Pro Cys Cys Ala Pro Thr Lys Leu Asn Ala Ile Ser Val Leu Tyr Phe  
65 70 75 80



Asp Asp Asn Ser Asn Val Ile Leu Lys Lys Tyr Arg Asn Met Val Val  
85 90 95

Arg Ala Cys Gly Cys His  
100

<210> 54  
<211> 103  
<212> PRT  
<213> Gallus gallus

<220>  
<223> DORSALIN

<400> 54  
Cys Arg Arg Thr Ser Leu His Val Asn Phe Lys Glu Ile Gly Trp Asp  
1 5 10 15

Ser Trp Ile Ile Ala Pro Lys Asp Tyr Glu Ala Phe Glu Cys Lys Gly  
20 25 30

Gly Cys Phe Phe Pro Leu Thr Asp Asn Val Thr Pro Thr Lys His Ala  
35 40 45

Ile Val Gln Thr Leu Val His Leu Gln Asn Pro Lys Lys Ala Ser Lys  
50 55 60

Ala Cys Cys Val Pro Thr Lys Leu Asp Ala Ile Ser Ile Leu Tyr Lys  
65 70 75 80

Asp Asp Ala Gly Val Pro Thr Leu Ile Tyr Asn Tyr Glu Gly Met Lys  
85 90 95

Val Ala Glu Cys Gly Cys Arg  
100

<210> 55  
<211> 102  
<212> PRT  
<213> Homo sapiens

<220>  
<223> OP-1

<400> 55  
Cys Lys Lys His Glu Leu Tyr Val Ser Phe Arg Asp Leu Gly Trp Gln  
1 5 10 15

Asp Trp Ile Ile Ala Pro Glu Gly Tyr Ala Ala Tyr Tyr Cys Glu Gly  
20 25 30

Glu Cys Ala Phe Pro Leu Asn Ser Tyr Met Asn Ala Thr Asn His Ala  
35 40 45

Ile Val Gln Thr Leu Val His Phe Ile Asn Pro Glu Thr Val Pro Lys  
50 55 60

Pro Cys Cys Ala Pro Thr Gln Leu Asn Ala Ile Ser Val Leu Tyr Phe  
65 70 75 80

Asp Asp Ser Ser Asn Val Ile Leu Lys Lys Tyr Arg Asn Met Val Val  
85 90 95

Arg Ala Cys Gly Cys His  
100

<210> 56  
<211> 102  
<212> PRT  
<213> Homo sapiens

<220>  
<223> OP-2

<400> 56  
Cys Arg Arg His Glu Leu Tyr Val Ser Phe Gln Asp Leu Gly Trp Leu  
1 5 10 15

Asp Trp Val Ile Ala Pro Gln Gly Tyr Ser Ala Tyr Tyr Cys Glu Gly  
20 25 30

Glu Cys Ser Phe Pro Leu Asp Ser Cys Met Asn Ala Thr Asn His Ala  
35 40 45

Ile Leu Gln Ser Leu Val His Leu Met Lys Pro Asn Ala Val Pro Lys  
50 55 60

Ala Cys Cys Ala Pro Thr Lys Leu Ser Ala Thr Ser Val Leu Tyr Tyr  
65 70 75 80

Asp Ser Ser Asn Asn Val Ile Leu Arg Lys His Arg Asn Met Val Val  
85 90 95

Lys Ala Cys Gly Cys His  
100

<210> 57  
<211> 102  
<212> PRT  
<213> Mus musculus

<220>  
<223> OP-3

<400> 57  
Cys Arg Arg His Glu Leu Tyr Val Ser Phe Arg Asp Leu Gly Trp Leu  
1 5 10 15

Asp Ser Val Ile Ala Pro Gln Gly Tyr Ser Ala Tyr Tyr Cys Ala Gly

20                      25                      30  
 Glu Cys Ile Tyr Pro Leu Asn Ser Cys Met Asn Ser Thr Asn His Ala  
          35                      40                      45  
 Thr Met Gln Ala Leu Val His Leu Met Lys Pro Asp Ile Ile Pro Lys  
          50                      55                      60  
 Val Cys Cys Val Pro Thr Glu Leu Ser Ala Ile Ser Leu Leu Tyr Tyr  
          65                      70                      75                      80  
 Asp Arg Asn Asn Asn Val Ile Leu Arg Arg Glu Arg Asn Met Val Val  
                          85                      90                      95  
 Gln Ala Cys Gly Cys His  
                          100

<210> 58  
 <211> 107  
 <212> PRT  
 <213> Mus musculus

<220>  
 <223> GDF-1

<400> 58  
 Cys Arg Thr Arg Arg Leu His Val Ser Phe Arg Glu Val Gly Trp His  
          1                      5                      10                      15  
 Arg Trp Val Ile Ala Pro Arg Gly Phe Leu Ala Asn Phe Cys Gln Gly  
                          20                      25                      30  
 Thr Cys Ala Leu Pro Glu Thr Leu Arg Gly Pro Gly Gly Pro Pro Ala  
                          35                      40                      45  
 Leu Asn His Ala Val Leu Arg Ala Leu Met His Ala Ala Ala Pro Thr  
                          50                      55                      60  
 Pro Gly Ala Gly Ser Pro Cys Cys Val Pro Glu Arg Leu Ser Pro Ile  
                          65                      70                      75                      80  
 Ser Val Leu Phe Phe Asp Asn Ser Asp Asn Val Val Leu Arg His Tyr  
                          85                      90                      95  
 Glu Asp Met Val Val Asp Glu Cys Gly Cys Arg  
                          100                      105

<210> 59  
 <211> 101  
 <212> PRT  
 <213> Mus musculus

<220>  
 <223> GDF-3

<400> 59

Cys His Arg His Gln Leu Phe Ile Asn Phe Gln Asp Leu Gly Trp His  
1 5 10 15

Lys Trp Val Ile Ala Pro Lys Gly Phe Met Ala Asn Tyr Cys His Gly  
20 25 30

Glu Cys Pro Phe Ser Met Thr Thr Tyr Leu Asn Ser Ser Asn Tyr Ala  
35 40 45

Phe Met Gln Ala Leu Met His Met Ala Asp Pro Lys Val Pro Lys Ala  
50 55 60

Val Cys Val Pro Thr Lys Leu Ser Pro Ile Ser Met Leu Tyr Gln Asp  
65 70 75 80

Ser Asp Lys Asn Val Ile Leu Arg His Tyr Glu Asp Met Val Val Asp  
85 90 95

Glu Cys Gly Cys Gly  
100

<210> 60

<211> 102

<212> PRT

<213> Mus musculus

<220>

<223> GDF-9

<400> 60

Cys Glu Leu His Asp Phe Arg Leu Ser Phe Ser Gln Leu Lys Trp Asp  
1 5 10 15

Asn Trp Ile Val Ala Pro His Arg Tyr Asn Pro Arg Tyr Cys Lys Gly  
20 25 30

Asp Cys Pro Arg Ala Val Arg His Arg Tyr Gly Ser Pro Val His Thr  
35 40 45

Met Val Gln Asn Ile Ile Tyr Glu Lys Leu Asp Pro Ser Val Pro Arg  
50 55 60

Pro Ser Cys Val Pro Gly Lys Tyr Ser Pro Leu Ser Val Leu Thr Ile  
65 70 75 80

Glu Pro Asp Gly Ser Ile Ala Tyr Lys Glu Tyr Glu Asp Met Ile Ala  
85 90 95

Thr Arg Cys Thr Cys Arg  
100

<210> 61

<211> 105

<212> PRT

<213> Homo sapiens

<220>

<223> INHIBIN-Alpha

<400> 61

Cys His Arg Val Ala Leu Asn Ile Ser Phe Gln Glu Leu Gly Trp Glu  
1 5 10 15

Arg Trp Ile Val Tyr Pro Pro Ser Phe Ile Phe His Tyr Cys His Gly  
20 25 30

Gly Cys Gly Leu His Ile Pro Pro Asn Leu Ser Leu Pro Val Pro Gly  
35 40 45

Ala Pro Pro Thr Pro Ala Gln Pro Tyr Ser Leu Leu Pro Gly Ala Gln  
50 55 60

Pro Cys Cys Ala Ala Leu Pro Gly Thr Met Arg Pro Leu His Val Arg  
65 70 75 80

Thr Thr Ser Asp Gly Gly Tyr Ser Phe Lys Tyr Glu Thr Val Pro Asn  
85 90 95

Leu Leu Thr Gln His Cys Ala Cys Ile  
100 105

<210> 62

<211> 106

<212> PRT

<213> Bos taurus

<220>

<223> INHIBIN-BetaA

<400> 62

Cys Cys Lys Lys Gln Phe Phe Val Ser Phe Lys Asp Ile Gly Trp Asn  
1 5 10 15

Asp Trp Ile Ile Ala Pro Ser Gly Tyr His Ala Asn Tyr Cys Glu Gly  
20 25 30

Glu Cys Pro Ser His Ile Ala Gly Thr Ser Gly Ser Ser Leu Ser Phe  
35 40 45

His Ser Thr Val Ile Asn His Tyr Arg Met Arg Gly His Ser Pro Phe  
50 55 60

Ala Asn Leu Lys Ser Cys Cys Val Pro Thr Lys Leu Arg Pro Met Ser  
65 70 75 80

Met Leu Tyr Tyr Asp Asp Gly Gln Asn Ile Ile Lys Lys Asp Ile Gln  
85 90 95

Asn Met Ile Val Glu Glu Cys Gly Cys Ser  
100 105

<210> 63  
<211> 106  
<212> PRT  
<213> Homo sapiens

<220>  
<223> INHIBIN-BetaB

<400> 63  
Cys Cys Lys Lys Gln Phe Phe Val Ser Phe Lys Asp Ile Gly Trp Asn  
1 5 10 15  
Asp Trp Ile Ile Ala Pro Ser Gly Tyr His Ala Asn Tyr Cys Glu Gly  
20 25 30  
Glu Cys Pro Ser His Ile Ala Gly Thr Ser Gly Ser Ser Leu Ser Phe  
35 40 45  
His Ser Thr Val Ile Asn His Tyr Arg Met Arg Gly His Ser Pro Phe  
50 55 60  
Ala Asn Leu Lys Ser Cys Cys Val Pro Thr Lys Leu Arg Pro Met Ser  
65 70 75 80  
Met Leu Tyr Tyr Asp Asp Gly Gln Asn Ile Ile Lys Lys Asp Ile Gln  
85 90 95  
Asn Met Ile Val Glu Glu Cys Gly Cys Ser  
100 105

<210> 64  
<211> 98  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: TGF-B  
SUBGROUP SEQUENCE PATTERN

<220>  
<223> Each Xaa is independently selected from a group of  
one or more specified amino acids as defined in  
the specification

<400> 64  
Cys Cys Val Arg Pro Leu Tyr Ile Asp Phe Arg Xaa Asp Leu Gly Trp  
1 5 10 15  
Lys Trp Ile His Glu Pro Lys Gly Tyr Xaa Ala Asn Phe Cys Xaa Gly  
20 25 30  
Xaa Cys Pro Tyr Xaa Trp Ser Xaa Asp Thr Gln Xaa Ser Xaa Val Leu  
35 40 45

Xaa Leu Tyr Asn Xaa Xaa Asn Pro Xaa Ala Ser Ala Xaa Pro Cys Cys  
     50                    55                    60  
 Val Pro Gln Xaa Leu Glu Pro Leu Xaa Ile Xaa Tyr Tyr Val Gly Arg  
     65                    70                    75                    80  
 Xaa Xaa Lys Val Glu Gln Leu Ser Asn Met Xaa Val Xaa Ser Cys Lys  
                     85                    90                    95  
 Cys Ser

<210> 65  
 <211> 104  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Each Xaa is independently selected from a group of  
         one or more specified amino acids as defined in  
         the specification

<220>  
 <223> Description of Artificial Sequence: VG/DPP  
         SUBGROUP SEQUENCE PATTERN

<400> 65  
 Cys Xaa Xaa Xaa Xaa Leu Tyr Val Xaa Phe Xaa Asp Xaa Gly Trp Xaa  
     1                    5                    10                    15  
 Asp Trp Ile Ile Ala Pro Xaa Gly Tyr Xaa Ala Xaa Tyr Cys Xaa Gly  
                     20                    25                    30  
 Xaa Cys Xaa Phe Pro Leu Xaa Xaa Xaa Xaa Asn Xaa Thr Asn His Ala  
                     35                    40                    45  
 Ile Xaa Gln Thr Leu Val Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Pro  
     50                    55                    60  
 Lys Xaa Cys Cys Xaa Pro Thr Xaa Leu Xaa Ala Xaa Ser Xaa Leu Tyr  
     65                    70                    75                    80  
 Xaa Asp Xaa Xaa Xaa Xaa Xaa Val Xaa Leu Xaa Xaa Tyr Xaa Xaa Met  
                     85                    90                    95  
 Xaa Val Xaa Xaa Cys Gly Cys Xaa  
                     100

<210> 66  
 <211> 107  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: GDF SUBGROUP

# PATTERN

<220>

<223> Each Xaa is independently selected from a group of one or more specified amino acids as defined in the specification

<400> 66

Cys Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Phe Xaa Xaa Xaa Xaa Trp Xaa  
1 5 10 15

Xaa Trp Xaa Xaa Ala Pro Xaa Xaa Xaa Xaa Xaa Xaa Xaa Cys Xaa Gly  
20 25 30

Xaa Cys Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa  
35 40 45

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa  
50 55 60

Pro Xaa Xaa Xaa Xaa Xaa Xaa Cys Val Pro Xaa Xaa Xaa Ser Pro Xaa  
65 70 75 80

Ser Xaa Leu Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Tyr  
85 90 95

Glu Asp Met Xaa Xaa Xaa Xaa Cys Xaa Cys Xaa  
100 105

<210> 67

<211> 109

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: INHIBIN  
SUBGROUP PATTERN

<220>

<223> Each Xaa is independently selected from a group of one or more specified amino acids as defined in the specification

<400> 67

Cys Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Phe Xaa Xaa Xaa Gly Trp Xaa  
1 5 10 15

Xaa Trp Ile Xaa Xaa Pro Xaa Xaa Xaa Xaa Xaa Xaa Tyr Cys Xaa Gly  
20 25 30

Xaa Cys Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa  
35 40 45

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa  
50 55 60



Xaa Xaa Xaa Xaa Xaa Cys Cys Xaa Xaa Xaa Pro Xaa Xaa Xaa Xaa Xaa  
65 70 75 80

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Asp Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa  
85 90 95

Xaa Xaa Xaa Asn Xaa Xaa Xaa Xaa Xaa Cys Xaa Cys Xaa  
100 105

<210> 68  
<211> 139  
<212> PRT  
<213> Homo sapiens

<220>  
<223> Mature H2223 mutant

<400> 68  
Ser Thr Gly Ser Lys Gln Arg Ser Gln Asn Arg Ser Lys Thr Pro Lys  
1 5 10 15

Asn Gln Glu Ala Leu Arg Met Ala Asn Val Ala Glu Asn Ser Ser Ser  
20 25 30

Asp Gln Arg Gln Ala Cys Lys Lys His Glu Leu Tyr Val Ser Phe Arg  
35 40 45

Asp Leu Gly Trp Gln Asp Trp Ile Ile Ala Pro Glu Gly Tyr Ala Ala  
50 55 60

Tyr Tyr Cys Glu Gly Glu Cys Ala Phe Pro Leu Asn Ser Tyr Met Asn  
65 70 75 80

Ala Thr Asn His Ala Ile Val Gln Thr Leu Val His Phe Ile Asn Pro  
85 90 95

Glu Thr Val Pro Lys Pro Cys Cys Ala Pro Thr Gln Leu Asn Ala Ile  
100 105 110

Ser Val Leu Tyr Phe Asp Asp Ser Ser Asn Val Ile Leu Lys Lys Tyr  
115 120 125

Glu Asp Met Val Val Glu Ala Cys Gly Cys Arg  
130 135

<210> 69  
<211> 117  
<212> PRT  
<213> Homo sapiens

<220>  
<223> Trypsin truncated H2223 mutant

<400> 69  
Met Ala Asn Val Ala Glu Asn Ser Ser Ser Asp Gln Arg Gln Ala Cys

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1   | 5   | 10  | 15  |     |     |     |     |     |     |     |     |     |     |     |     |
| Lys | Lys | His | Glu | Leu | Tyr | Val | Ser | Phe | Arg | Asp | Leu | Gly | Trp | Gln | Asp |
|     |     | 20  |     |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Trp | Ile | Ile | Ala | Pro | Glu | Gly | Tyr | Ala | Ala | Tyr | Tyr | Cys | Glu | Gly | Glu |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Cys | Ala | Phe | Pro | Leu | Asn | Ser | Tyr | Met | Asn | Ala | Thr | Asn | His | Ala | Ile |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Val | Gln | Thr | Leu | Val | His | Phe | Ile | Asn | Pro | Glu | Thr | Val | Pro | Lys | Pro |
|     | 65  |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| Cys | Cys | Ala | Pro | Thr | Gln | Leu | Asn | Ala | Ile | Ser | Val | Leu | Tyr | Phe | Asp |
|     |     |     |     | 85  |     |     |     | 90  |     |     |     |     |     | 95  |     |
| Asp | Ser | Ser | Asn | Val | Ile | Leu | Lys | Lys | Tyr | Glu | Asp | Met | Val | Val | Glu |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Ala | Cys | Gly | Cys | Arg |     |     |     |     |     |     |     |     |     |     |     |
|     |     | 115 |     |     |     |     |     |     |     |     |     |     |     |     |     |

<210> 70

<211> 33

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer #1

<220>

<221> CDS

<222> (1)..(33)

<400> 70

gcg ccc acg cag ctc agc gct atc tcc gtc ctc  
Ala Pro Thr Gln Leu Ser Ala Ile Ser Val Leu  
1 5 10

33

<210> 71

<211> 11

<212> PRT

<213> Artificial Sequence

<400> 71

Ala Pro Thr Gln Leu Ser Ala Ile Ser Val Leu  
1 5 10

<210> 72

<211> 43

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer #2

<400> 72

ctatctgcag ccacaagctt cgaccacat gtcttcgtat ttc

43

<210> 73

<211> 43

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: complement of  
Primer #2

<220>

<221> CDS

<222> (2)..(43)

<400> 73

g aaa tac gaa gac atg gtg gtc gaa gct tgt ggc tgc aga tag

43

Lys Tyr Glu Asp Met Val Val Glu Ala Cys Gly Cys Arg

1

5

10

<210> 74

<211> 13

<212> PRT

<213> Artificial Sequence

<400> 74

Lys Tyr Glu Asp Met Val Val Glu Ala Cys Gly Cys Arg

1

5

10

<210> 75

<211> 44

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: the sequence  
between the T7 promoter, at the XbaI site, and the  
ATG codon

<400> 75

tctagaataa ttttgttttaa cctttaagaa ggagatatac gatg

44

<210> 76

<211> 19

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer #3

<400> 76  
taatacgact cactatagg 19

<210> 77  
<211> 18  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Primer #4

<400> 77  
gctgagctgc gtgggcgc 18

<210> 78  
<211> 18  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: complement of  
Primer #4

<220>  
<221> CDS  
<222> (1)..(18)

<400> 78  
gcg ccc acg cag ctc agc 18  
Ala Pro Thr Gln Leu Ser  
1 5

<210> 79  
<211> 6  
<212> PRT  
<213> Artificial Sequence

<400> 79  
Ala Pro Thr Gln Leu Ser  
1 5

<210> 80  
<211> 23  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Primer #5

<400> 80  
ggatcctatc tgcagccaca agc 23

<210> 81  
 <211> 23  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: complement of  
 Primer #5

<220>  
 <221> CDS  
 <222> (1)..(18)

<400> 81  
 gct tgt ggc tgc aga tag gatcc  
 Ala Cys Gly Cys Arg  
 1 5

23

<210> 82  
 <211> 5  
 <212> PRT  
 <213> Artificial Sequence

<400> 82  
 Ala Cys Gly Cys Arg  
 1 5

<210> 83  
 <211> 102  
 <212> PRT  
 <213> Homo sapiens

<220>  
 <223> CDMP-1/GDF-5

<400> 83  
 Cys Ser Arg Lys Ala Leu His Val Asn Phe Lys Asp Met Gly Trp Asp  
 1 5 10 15  
 Asp Trp Ile Ile Ala Pro Leu Glu Tyr Glu Ala Phe His Cys Glu Gly  
 20 25 30  
 Leu Cys Glu Phe Pro Leu Arg Ser His Leu Glu Pro Thr Asn His Ala  
 35 40 45  
 Val Ile Gln Thr Leu Met Asn Ser Met Asp Pro Glu Ser Thr Pro Pro  
 50 55 60  
 Thr Cys Cys Val Pro Thr Arg Leu Ser Pro Ile Ser Ile Leu Phe Ile  
 65 70 75 80  
 Asp Ser Ala Asn Asn Val Val Tyr Lys Gln Tyr Glu Asp Met Val Val  
 85 90 95

Glu Ser Cys Gly Cys Arg  
100

<210> 84  
<211> 102  
<212> PRT  
<213> Homo sapiens

<220>  
<223> CDMP-2/GDF-6

<400> 84  
Cys Ser Lys Lys Pro Leu His Val Asn Phe Lys Glu Leu Gly Trp Asp  
1 5 10 15  
Asp Trp Ile Ile Ala Pro Leu Glu Tyr Glu Ala Tyr His Cys Glu Gly  
20 25 30  
Val Cys Asp Phe Pro Leu Arg Ser His Leu Glu Pro Thr Asn His Ala  
35 40 45  
Ile Ile Gln Thr Leu Met Asn Ser Met Asp Pro Gly Ser Thr Pro Pro  
50 55 60  
Ser Cys Cys Val Pro Thr Lys Leu Thr Pro Ile Ser Ile Leu Tyr Ile  
65 70 75 80  
Asp Ala Gly Asn Asn Val Val Tyr Lys Gln Tyr Glu Asp Met Val Val  
85 90 95  
Glu Ser Cys Gly Cys Arg  
100

<210> 85  
<211> 102  
<212> PRT  
<213> Mus musculus

<220>  
<223> GDF-6

<400> 85  
Cys Ser Arg Lys Pro Leu His Val Asn Phe Lys Glu Leu Gly Trp Asp  
1 5 10 15  
Asp Trp Ile Ile Ala Pro Leu Glu Tyr Glu Ala Tyr His Cys Glu Gly  
20 25 30  
Val Cys Asp Phe Pro Leu Arg Ser His Leu Glu Pro Thr Asn His Ala  
35 40 45  
Ile Ile Gln Thr Leu Met Asn Ser Met Asp Pro Gly Ser Thr Pro Pro  
50 55 60  
Ser Cys Cys Val Pro Thr Lys Leu Thr Pro Ile Ser Ile Leu Tyr Ile

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 65  | 70  | 75  | 80  |     |     |     |     |     |     |     |     |     |     |     |     |
| Asp | Ala | Gly | Asn | Asn | Val | Val | Tyr | Lys | Gln | Tyr | Glu | Asp | Met | Val | Val |
|     |     |     | 85  |     |     |     |     |     | 90  |     |     |     |     | 95  |     |

Glu Ser Cys Gly Cys Arg  
100

<210> 86  
<211> 102  
<212> PRT  
<213> Bos taurus

<220>  
<223> CDMP-2

|   |
|---|
| <400> 86  |
| Cys Ser Lys Lys Pro Leu His Val Asn Phe Lys Glu Leu Gly Trp Asp |
| 1 5 10 15   |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Trp | Ile | Ile | Ala | Pro | Leu | Glu | Tyr | Glu | Ala | Tyr | His | Cys | Glu | Gly |
|     |     | 20  |     |     |     |     | 25  |     |     |     |     |     | 30  |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Cys | Asp | Phe | Pro | Leu | Arg | Ser | His | Leu | Glu | Pro | Thr | Asn | His | Ala |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ile | Ile | Gln | Thr | Leu | Met | Asn | Ser | Met | Asp | Pro | Gly | Ser | Thr | Pro | Pro |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ser | Cys | Cys | Val | Pro | Thr | Lys | Leu | Thr | Pro | Ile | Ser | Ile | Leu | Tyr | Ile |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Ala | Gly | Asn | Asn | Val | Val | Tyr | Asn | Glu | Tyr | Glu | Glu | Met | Val | Val |
|     |     |     | 85  |     |     |     |     |     | 90  |     |     |     |     | 95  |     |

Glu Ser Cys Gly Cys Arg  
100

<210> 87  
<211> 102  
<212> PRT  
<213> Mus musculus

<220>  
<223> GDF-7

|   |
|---|
| <400> 87  |
| Cys Ser Arg Lys Ser Leu His Val Asp Phe Lys Glu Leu Gly Trp Asp |
| 1 5 10 15   |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Trp | Ile | Ile | Ala | Pro | Leu | Asp | Tyr | Glu | Ala | Tyr | His | Cys | Glu | Gly |
|     |     | 20  |     |     |     |     | 25  |     |     |     |     |     | 30  |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Cys | Asp | Phe | Pro | Leu | Arg | Ser | His | Leu | Glu | Pro | Thr | Asn | His | Ala |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |

Ile Ile Gln Thr Leu Leu Asn Ser Met Ala Pro Asp Ala Ala Pro Ala  
50 55 60

Ser Cys Cys Val Pro Ala Arg Leu Ser Pro Ile Ser Ile Leu Tyr Ile  
65 70 75 80

Asp Ala Ala Asn Asn Val Val Tyr Lys Gln Tyr Glu Asp Met Val Val  
85 90 95

Glu Ala Cys Gly Cys Arg  
100

<210> 88  
<211> 102  
<212> PRT  
<213> Homo sapiens

<220>  
<223> CDMP-3 construct

<400> 88  
Cys Ser Arg Lys Pro Leu His Val Asp Phe Lys Glu Leu Gly Trp Asp  
1 5 10 15

Asp Trp Ile Ile Ala Pro Leu Asp Tyr Glu Ala Tyr His Cys Glu Gly  
20 25 30

Leu Cys Asp Phe Pro Leu Arg Ser His Leu Glu Pro Thr Asn His Ala  
35 40 45

Ile Ile Gln Thr Leu Leu Asn Ser Met Ala Pro Asp Ala Ala Pro Ala  
50 55 60

Ser Cys Cys Val Pro Ala Arg Leu Ser Pro Ile Ser Ile Leu Tyr Ile  
65 70 75 80

Asp Ala Ala Asn Asn Val Val Tyr Lys Gln Tyr Glu Asp Met Val Val  
85 90 95

Glu Ala Cys Gly Cys Arg  
100